UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/054,706	01/24/2002	Farrokh Alemi	GMU-22U	5413

28598 7590 03/19/2007			EXAMINER	
GEORGE MASON UNIVERSITY			GOTTSCHALK, MARTIN A	
OFFICE OF TECHNOLOGY TRANSFER, MSN 5G5				
4400 UNIVERSITY DRIVE			ART UNIT	PAPER NUMBER
FAIRFAX, VA 22030			3694	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

	Application No.	Applicant(s)
Office Action Summary	10/054,706	ALEMI, ET AL.
	Examiner	Art Unit
	Martin A. Gottschalk	3694

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>08 December 2006</u>.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle,* 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-8</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-8</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)./Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other:_____.

DETAILED ACTION

Notice to Applicant

1.   Claims 1-8 are pending and remain unamended.

Specification

2.   The amendment to the specification to reduce the length of the abstract to 150 words or less is hereby acknowledged. The objection is withdrawn.

Claim Rejections - 35 USC § 112

3.   Applicant has pointed to passages in the specification which provide support for the claimed material which was the basis for this rejection. The rejection is thus hereby withdrawn.

Note: The claims are unamended and the rejections from the previous Office Action are reproduced here for the convenience of the reader only:

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1,

148 USPQ 459 (1966), that are applied for establishing a background for

determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

     1.   Determining the scope and contents of the prior art.
     2.   Ascertaining the differences between the prior art and the claims at issue.
     3.   Resolving the level of ordinary skill in the pertinent art.
     4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

6.   Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Seare et al (US Pat# 5,557,514, hereinafter Seare) in view of Ziegele (PG

Pub# US 2005/0125257, hereinafter Ziegele), and further in view of Lockwood

(US Pat# 5,706,441, hereinafter Lockwood).

A.   As per claim 1, Seare discloses an episode classification system

including:

a. a multitude of diagnosis records (Seare: col 21, lns 10-19), each of said

diagnosis records including:

i. diagnoses information (Seare: col 22, lns 14-27, e.g. "claim ID");

ii. time of diagnoses information (Seare: col 22, lns 14-27, e.g.

"claim ID");

and

iii. patient information (Seare: col 22, lns 14-27); .

b. a patient grouper for generating at least one patient group, each patient group generated by grouping patient records having similar patient information (Seare: Seare: col 24, lns 18-21, i.e. sorting by "index code");

c. a diagnosis grouper for generating at least one diagnosis group from a patient group, each diagnosis group generated by grouping patient records from a patient group that have similar diagnosis information (Seare: col 24, lns 21-26, i.e. sorting on "qualifying ICD codes");

d. an episode analyzer including:

ii. a episode grouper for grouping diagnosis records determined to belong to a single episode (Seare: Figs 2-5, and 12; col 23, section titled "Determination of Episode of Care").

Seare fails to disclose item d-i, however this feature is disclosed by Ziegele, who teaches

i. a probability analyzer for performing probability calculations, each of

said probability calculations capable of generating a probability value

using at least two of said multitude of diagnosis records as input entries,

said probability value representing the probability that said input entries

belong to a single episode (Ziegele: Fig 1; [0014] - [0016]);

It would have been obvious to one of ordinary skill in the art at the time of

the invention to incorporate the teachings of Ziegele into the system of Seare

with the motivation of maintaining updated relationships between diagnostic

information records and actual and potential treatment modalities relevant to the

diagnosis (Ziegele: [0010]).

Seare further fails to disclose item d-iii, however this feature is disclosed

by Lockwood, who teaches

iii. a severity analyzer for performing episode severity calculations,

each of said episode severity calculations capable of generating an

episode severity value (Lockwood: col 4, lns 46-61).

It would have been obvious at the time of the invention to one of ordinary

skill in the art to incorporate the teachings of Lockwood into the system taught by

Seare with the motivation of accurately differentiating levels of case complexity

handled by different categories of healthcare providers (Lockwood: col 3, lns 43-53).

In subsequent claims combining the teachings of Seare, Lockwood, and Ziegele, the same motivation is applied as above, will not be repeated, and is incorporated therein.

B.   As per claims 2-4, Seare discloses an episode classification system according to claim 1 wherein at least one of said diagnosis records is

(claim 2)   an anchor diagnosis record (Seare: col 22, lns 49-52, reads on "date of service from");

(claim 3)   a trigger diagnosis record (Seare col 8, ln 50 to col 9, ln 47, note the triggering effect of the Index table which the Examiner considers to be a type of trigger diagnosis record);

(claim 4)   stopping point diagnosis record (Seare: col 22, lns 49-52, reads on "date of service to").

C.   As per claim 5, episode classification system according to claim 1 wherein said

calculation:

    b. is a function of:

        i. a similarity value, said similarity value representing the similarity

        between said pair of diagnostic records (Seare: e.g. an index code

        represents a similarity value, col 7, lns 35-64);

        and

        ii. a time between diagnosis value, said time between diagnosis

        value representing the time between said pair of diagnostic records

        (Seare: col 24, ln 60 to col 25 ln 26).

Seare discloses operating on one or more records but fails to disclose

operating specifically on a pair of records. However this feature is well known in

the art as evidenced by the teachings of Ziegele who teaches a probability

calculation which

    a. operates on a pair of diagnosis records (Ziegele: [0079]-[0080]).

D.   As per claim 6, Seare teaches the similarity value as per the previous

claim, but fails to explicitly disclose the rest of the claim, however these features

are taught by Ziegele who teaches the episode classification system according to
claim 5 wherein said probability calculation includes

> a probability numerator divided by a probability denominator said
>
> probability numerator set to said similarity value times a first constant and
>
> said probability denominator set to the quantity of a second constant times
>
> said time between diagnosis value plus one (Ziegele: [0032], i.e. the
>
> constants both equal 1. The Examiner notes that probability calculation is
>
> old and, applying a variety of well-developed equations.).

E.   As per claim 7, Seare discloses a method for episode classification using
a multitude of diagnosis records (Seare: col 21, lns 10-19), each of said multitude
of diagnosis records including: diagnosis information; time of diagnoses
information; and patient information (Seare: col 22, lns 8-27); including the steps
of:

> a. creating at least one diagnosis pair from said multitude of diagnosis
>
> records, each said diagnosis pair containing a unique combination of two
>
> diagnoses information (Seare: col 24, lns 18-21, i.e. index codes contain
>
> at least one pair of diagnoses information.);

> b. for each said diagnosis pair, iteratively:

i. determining a co-occurrence value, said co-occurrence value being the number of unique patients for whom the two diagnoses contained in each of said diagnosis pairs occurred within a co-occurrence window;

and

ii. associating said co-occurrence value with each diagnosis information contained in said diagnosis pair (Seare: col 27, lns 15-27);

c. creating at least one patient group, each said patient group generated by grouping said diagnosis records having similar said patient information (Seare: col 24, lns 21-26, i.e. sorting patients by "qualifying ICD code" produces a patient group.);

and

d. for each said patient group, iteratively:

i. creating at least one diagnosis group, each said diagnosis group generated by grouping said diagnosis records having similar said diagnosis information (Seare: col 24, lns 26-33, i.e., patients

grouped by undertaking "procedures related to a specific medical condition");

ii. for each said diagnosis group, iteratively adding a unique occurrence identifier to said diagnosis information for each said diagnosis record (Seare: col 24, lns 38-45, reads on "staging indicator");

iii. creating at least one time between diagnosis pair from said diagnosis records in said diagnosis group, each said time between diagnosis pair containing a unique combination of two said diagnosis records (Seare: col 24, lns 60-66, time between diagnosis reads on "clear window");

iv. for each said time between diagnosis pair, iteratively:

1. setting a time between diagnosis pair value for each said diagnosis pair equal to the absolute value of the difference between said time of diagnoses information from each said diagnosis record in said diagnosis group (Seare: col 24, ln 60 to col 25, ln 26);

2. setting a score numerator equal to said co-occurrence

value having the same combination of diagnosis information

as said time between diagnosis pair value (Seare: col 27, lns

15-27, reads on "adjustment factor");

3. calculating a score for said diagnosis pair by dividing said

score numerator by said time between diagnosis pair value

(The Examiner notes that the arithmetic process of division

is well known);

and

4. associating said score to said diagnosis pair (Seare: col

27, lns 15-27);

v. setting a minimum score value equal to the minimum said score

from the set of said scores associated to each of said diagnosis

pairs in said patient group;

vi. setting a maximum score value equal to the maximum said

score from the set of said scores associated to each of said

diagnosis pairs in said patient group;

vii. setting a difference score value equal to difference of said

maximum score value and said minimum score value (for steps v-

vii, see Seare: col 27, ln 44 to col 28, ln 3, i.e. maximum and

minimum scores provide the limits of the recited "defined statistical

criteria"; difference reads on "variance");

viii. for each said diagnosis pair, iteratively:

    1. setting a standardized score numerator value equal to

    said minimum score minus said score associated to said

    time between diagnosis pair;

    2. setting a standardized score equal to said standardized

    score numerator divided by said difference score value; and

    3. associating said standardized score to said diagnosis pair

    (for steps viii 1-3, the Examiner notes that the statistical

    procedure of standardizing scores is well known. Also see

    Seare: col 6, ln 15 which identifies CPT codes as "standard,"

    and note that the CPT and codes drive the scoring system of

    the reference invention.);

and

ix. classifying each said diagnosis information into at least one

episode using said standardized score (Seare: col 25, lns 38-43).

F.   As per claim 8, Seare discloses a method according to claim 7 wherein

said step of classifying each said diagnosis information into at least one episode

includes the steps of:

a. flagging each of said diagnosis information in said patient group for

analysis (Seare: col 22, lns 10-12);

and

b. until all diagnosis information in said patient group is analyzed,

iteratively:

i. combining two of said diagnosis information in said patient group

flagged for analysis which have the maximum said standardized

scores not exceeding a preset cutoff into an episode record (Seare:

col 25, lns 29 - 62);

ii. creating a new diagnosis information, said new diagnosis

information representing said diagnosis information in said episode

record;

iii. calculating a new standardized score for said new diagnosis

information by averaging the standardized score associated with

each of said diagnosis information in said episode record (for steps

b ii-iii, see Seare: col 25, ln 65 to col 26, ln 6);

and

iv. de-flagging said diagnosis information in said episode record for

further analysis (Seare: col 26, 12-13).

Response to Arguments

7.   Applicant's arguments in the response filed 12/08/2006 have been fully

considered but they are not persuasive.

A.   On page 5 of the response, Applicant argues that the applied reference

Ziegele calculates a "different type of probability" than that in sub-claim 1(d)(i). In

response, the Examiner notes that it is the combination of teachings of the

Seare, Ziegele, and Lockwood references that teach the entire claim. The Seare

reference in the cited passage teaches rigorously defining an episode, whereas

Ziegele teaches probability analysis wherein the probability of information being

associated with diagnosis is determined. The combination of references would

teach probabilistically associating diagnosis information with episode information.

B.   On page 6 of the response, Applicant argues there was not a proper

motivation to incorporate the teachings of Ziegele into the system of Seare,

apparently because the cited motivation to combine the references does not

teach the feature of the claim. In response, it should be noted that the fact that

Applicant has recognized another advantage which would flow naturally from

following the suggestion of the prior art cannot be the basis for patentability when

the differences would otherwise be obvious. See *Ex parte Obiaya*, 227

USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Note further that the specific

citations are provided for the features of the claim.

C.   On page 7, Applicant states that there was not "one instance in Seare that ·

discloses that diagnosis records are processed in pairs," and states that this is an

important feature of the claim. In response, the Examiner respectfully points to

Seare col 24, lns 38-40 and notes the patient records are searched for co-

occurring diagnoses, i.e. if one diagnosis occurs, the record is searched for at

least one, paired, co-occurring diagnosis. The Examiner considers this to be a

type of pairwise processing of the records.

D.   On page 8, Applicant argues that the cited "staging indicator" is not the

same as the claimed unique occurrence identifier, because the staging indicator

can appear on more than one record. In response, the Examiner wishes to clarify it is the "staging indicator...associated with the index code" which is the unique identifier, and it is added to each of the records, as is claimed.

E.   On page 9 Applicant the reference citation does not teach the claimed "score numerator." The Examiner wishes to clarify that it is the "adjustment factor...multiplied against the occurrence count..." which results in the score numerator (in the passage, $0.6 \times 10 = 6$) which is stored. Note further there is a plurality of recited adjustment factors in the passage.

F.   On page 11, Applicant argues the Examiner's assertion "that the arithmetic process of division is well known," as it is applied to claim 7. In response, the Examiner wishes to clarify that it does not appear there is reason why the two claimed quantities must necessarily be divided other than to create an empirical ratio. The process of making such a comparison is well known, and other such comparisons such as those described in Seare: col 27, section 2 are also well known - the ultimate purpose being to produce scores which can be used calculate the statistics described in the rest of claim 7 (e.g. minima and maxima to establish a range; standardized scores), the processes of which are also well known.

Conclusion

8.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of

time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire

THREE MONTHS from the mailing date of this action. In the event a first reply is

filed within TWO MONTHS of the mailing date of this final action and the advisory

action is not mailed until after the end of the THREE-MONTH shortened statutory

period, then the shortened statutory period will expire on the date the advisory

action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

calculated from the mailing date of the advisory action. In no event, however, will

the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Martin A. Gottschalk whose telephone

number is (571) 272-7030. The examiner can normally be reached on Mon - Fri

8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, James P. Trammell can be reached on (571) 272-6712.

The fax phone number for the organization where this application or proceeding

is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MG
03/01/2007

ELLA COLBERT
PRIMARY EXAMINER